

**Abstract**

The present invention relates to a process for preparing optionally alkyl-substituted 1,4-butanediol by two-stage catalytic hydrogenation in the gas phase of C<sub>4</sub>-dicarboxylic acids and/or of derivatives thereof having the following steps:

- a) introducing a gas stream of a C<sub>4</sub>-dicarboxylic acid or of a derivative thereof at from 200 to 300°C and from 2 to 60 bar into a first reactor and catalytically hydrogenating it to a product which contains mainly optionally alkyl-substituted  $\gamma$ -butyrolactone;
  - b) converting the product stream into the liquid phase;
  - c) introducing the product stream obtained in this way into a second reactor at a temperature of from 100°C to 240°C and a pressure of from 20 to 250 bar and catalytically hydrogenating it in the liquid phase to optionally alkyl-substituted 1,4-butanediol;
  - d) removing the desired product from by-products and any unconverted reactants;
  - e) optionally recycling unconverted intermediates into one or both hydrogenation stages,
- said hydrogenation stages both using a catalyst which comprises  $\leq 95\%$  by weight, preferably from 5 to 95% by weight, in particular from 10 to 80% by weight, of CuO, and  $\geq 5\%$  by weight, preferably from 5 to 95% by weight, in particular from 20 to 90% by weight, of a support, said second reactor having a higher pressure than said first reactor, and the product mixture removed from said first reactor being introduced without further purification into said second reactor.